

ENVIRONMENTAL CONSEQUENCES



ALTERNATIVE 1: PROPOSED ACTION

IMPACTS ON NATURAL ENVIRONMENT

The recovery of the desert tortoise would likely be accelerated by implementing the proposed action, which incorporates the management recommendations of the 1994 U.S. Fish and Wildlife Service Desert Tortoise Recovery Plan. Implementing the recovery plan's recommendations as proposed would have positive effects on the soil, water, vegetation, and wildlife, including the desert tortoise. Hunting would be allowed when desert tortoises are inactive on the surface (September–February). Restricting the hunting season would allow better control of illegal use of weapons in the non-hunting season. This alternative should result in fewer desert tortoises being killed and less cultural resource damage by vandals. Where vehicle-related tortoise mortality was identified, some roads may be closed or fenced, or speed limits imposed during periods when the tortoises are most vulnerable to being run over by vehicles.

Mojave National Preserve's native plant and animal populations would benefit from this alternative. As burros were removed and grazing was reduced through acquisition, more water from natural sources would be available for wildlife use and vegetation, and the amount of soil compaction should diminish. These actions would also reduce impacts on the desert tortoise and native wildlife. As livestock tanks, troughs, and guzzlers were removed (if studies indicated a benefit to wildlife and vegetation from their removal), the environment would start a restoration process. An immediate and dramatic change would occur at the sites where these water developments are removed and vegetation is allowed to recover. Over time wildlife populations would adjust to changes in water availability, and a desert much more typical of a pre-Columbian era should result. Visual aesthetics would change over time as the native vegetation and soils recover from burro and cattle grazing. The time that would be needed to complete the natural recovery process is unknown.

Not allowing additional guzzler installations for wildlife populations, which are naturally limited by the amount of existing water, would limit their population levels. There would be no new artificial water developments to supplement wildlife populations and subsequently no increased opportunities for visitors to observe and to hunt those specific wildlife species. There would also be less opportunities for plant and soil damage from wildlife populations, kept at unnaturally high populations levels due to the addition of artificial water developments.

No existing guzzlers are planned to be removed under this proposal. Future studies would determine the impacts from removing or retaining guzzlers.

The tamarisk trees at the Kelso Depot have not been tied to the historic landscape and might need to be replaced with trees that restore the historic landscape. Removing the trees might displace nesting birds, but no listed bird species are associated with this area.

Native vegetation and wildlife would benefit from tamarisk control efforts. This action would not affect the tamarisk trees along the railroad tracks.

Removal of the burro population would cause short-term disturbance of the desert vegetation and wildlife due to noise (helicopters, horses, trucks, wranglers, etc.) and inadvertent trampling from capture crews and their equipment during the capture operation. Larger mammals such as deer and bighorn would leave the local area during these activities. If and when the third phase is implemented, burros would be killed at a time of year when tortoises are not active. This would limit the possibility of attracting ravens to the carrion that would prey upon young tortoises. Burros would be killed away from public view. As burros are eliminated and grazing is reduced, the noticeable disturbance to the landscape including overgrazing, fouling of springs and seeps, burro trails, and soil compaction would diminish over time. Complete recovery would take decades.

The possible closure of some campsites located in critical habitat or in sensitive areas would reduce the potential for impacts to wildlife and plant species and other natural resources in these areas.

Establishment of new semi-developed campgrounds would impact soils and wildlife habitat during and after construction, but impacts on other undeveloped areas could be reduced by visitors relocating to semi-developed campgrounds.

Designating campsites with fabricated fire rings or markers and closing others in high use areas or sensitive habitats could reduce the negative impacts on soil, water sources, desert tortoise, vegetation, wildlife, cultural features, and other resources in sensitive landscapes.

Constructing roadside pullouts for interpretive displays and a visitor center at the Kelso Depot would disturb soils and plants. Creating a museum and interpretive facility at Kelso Depot would increase visitor understanding and appreciation of natural resources. The depot would be a good location for the NPS staff to present the area's natural and cultural resources and ways in which the public can help protect these features. As visitors received information on low-impact camping and as the maintenance staff managed adverse impacts, soil disturbance and impacts on vegetation from roadside camping would be minimized. Adverse impacts on soils, wildlife, and vegetation would be limited by the use of previously disturbed areas for construction.

The landscape surrounding the Kelso Depot and the properties proposed for acquisition have been heavily impacted from previous vehicle traffic and people walking on these sites. About 2-3 acres of land that is now private property could be disturbed by construction of parking, walks, and new visitor facilities. Construction would adversely affect natural resources such as soils and vegetation, but most land being considered for development has been previously disturbed from prior use. There would be short-term impacts from dust caused by construction activities, but mitigation efforts such as

watering excavation work would minimize dust levels. Long-term effects on dust generation would be beneficial as parking lots are surfaced.

If Union Pacific was willing to cooperate with the National Park Service to establish an outdoor railroad exhibit area and a train viewing platform at Kelso, an estimated 1 acre of previously disturbed land could be negatively impacted by construction and visitor use. Previously disturbed land would be used to minimize impacts.

Drilling for a new water well to an estimated depth of 2,000 feet to support the Kelso Depot would place an additional demand upon the groundwater. No effects on natural resources or surface water sources would likely result from the use of this water table at this depth. Other than the desert tortoise, there are no known threatened or endangered species associated with the habitat that exist around the depot; therefore, no impacts would result. If the National Park Service acquired additional historic structures, these buildings would be surveyed to determine if any endangered bat species would be impacted. Appropriate mitigating measures would be taken if needed.

The use of heavy equipment to reinforce the dike north of the Kelso Depot and place boulder riprap or other armoring on the face of the dike would disturb soils, vegetation, and wildlife habitat. To mitigate impacts, vehicles would be required to work to within the area that was disturbed when the dike was created. This area also functions as a drainage wash. Since the work would be done within desert tortoise critical habitat, a biological survey would be conducted before any work began to locate and flag any active tortoise burrows. Equipment would be diverted around burrows where possible, and tortoises would be relocated to a safe area if necessary. A park employee or contract biologist would monitor construction activity to keep equipment away from burrows and to locate any tortoises present at the construction area.

Constructing a proposed roadside pullout and an interpretive path at the historic iron ore loading site at Kelso would disturb some vegetation and soil. Soil disturbance would be shallow because of the character of the new visitor facilities. The site would be surveyed for the presence of tortoise burrows. Efforts would be made to direct the path around significant vegetation and any burrows to reduce impacts. Vegetation and soils adjacent to the path and parking would be affected by trampling. Previously disturbed ground would be used for construction to limit negative impacts on soil, wildlife, and vegetation. The National Park Service would follow county development codes and regulations for construction on nonfederal land.

As nonfederal lands were purchased, resources would be protected against incompatible development. The National Park Service would try to limit any new incompatible development through acquisition and to provide permanent protection for the preserve resources. If funds were not available for acquisition, impacts would be similar to those of the no-action alternative.

IMPACTS ON CULTURAL RESOURCES

Archeological sites, historic properties, cultural landscapes, and ethnographic resources in Mojave National Preserve would benefit from the proposed action through the implementation of a systematic and integrated inventory, research, and preservation program to protect, preserve, and interpret properties listed on, or determined eligible for listing on, the National Register of Historic Places.

Cultural resources may be adversely affected by vandalism or inadvertent damage resulting from an increase in visitation. Actions to mitigate these impacts would be initiated, as funding allows, including increased patrols, monitoring to detect vandalism and illegal collection, and an increased level of visitor education programs. Restriction on hunting seasons would allow more control of illegal weapon use during the nonhunting season and would enhance cultural resource protection.

The potential for burros and cattle to trample and damage or destroy cultural resources would diminish with this alternative. The number of cattle grazing within the preserve would not increase, and as grazing leases became available for acquisition by the government, allotments would be permanently retired. Consequently, the total number of working cattle ranches in the preserve would decrease over time. Many people regard desert cattle ranching as a historical use; therefore, some people would consider a decline in the number of ranches a negative impact. If the National Park Service acquired private land, an archeological survey would be conducted to identify and properly deal with existing features with cultural significance. The design of future facilities would mitigate negative impacts on identified significant cultural features according to appropriate NPS policies and standards.

The Kelso Depot development concept plan preferred action recommends that parking, a comfort station, and an unstaffed information center be located away from the depot. This would have a positive effect on the historical setting for the depot by removing the existing informal parking areas around the depot. Reconstructing a historical landscape around the depot would also have a positive effect on the visual and cultural setting of the depot.

The proposed NPS acquisition and restoration or stabilization of the historic Kelso general store/post office and/or the schoolhouse would have a positive effect on the historical setting for the town of Kelso. It would also help preserve these buildings.

The National Park Service conducted an archeological survey of the Kelso Depot property in 1996 and submitted a report as part of a draft historic structure report for the depot in March 1997. The report recommended that several items be left undisturbed during construction. Among these items were palm trees, brick pavement edging, and lamppost bases around the depot. Mitigation efforts would include fencing or other barriers to protect these objects. These items would be considered in future design work according to federal guidelines.

Cultural resources would not be affected by dike modifications at Kelso. Construction work would be limited to soil that was previously excavated to a depth of up to 10 feet below the existing grade.

Constructing a roadside pullout and an interpretive path at the historic iron ore loading site at Kelso could disturb cultural resources in the ground. An archeological survey would be completed before site-specific design work to identify any archeological features and to mitigate negative impacts. People walking off paths at this historic site could adversely affect the resource. The interpretive program would provide messages about respecting cultural resources and staying on paths to minimize impacts. The site would benefit from actions to preserve it and indirectly from visitor education about the value of the resources.

Lands containing significant cultural resources important to the history of the preserve could be acquired and protected by stabilization efforts and regular enforcement patrols. Bringing historic resources into public ownership would increase opportunities for visitors to enjoy these resources.

IMPACTS ON NATIVE AMERICAN INTERESTS

Developing communication protocols and establishing a cooperative agreement with affected tribes would increase the level of communication and result in greater consideration of Native American issues during decision making. Greater understanding of concerns would foster better relationships. As communications progressed, the preserve would gain a better understanding of the presence of sacred and traditional use areas and be better able to protecting them.

Information provided at the Kelso Depot visitor center might raise public understanding and appreciation of tribal ties to the Mojave Desert. Native American sacred sites would receive additional protection, and camping near those sites might be eliminated.

IMPACTS ON VISITOR USE, SERVICES, AND FACILITIES

Visitor aesthetics would change significantly. There would be fewer opportunities to see burros in the preserve, but habitat would slowly recover, providing a long-term aesthetic benefit. Some visitors would consider the absence of the burros an adverse effect, but others would regard it as a positive effect. If the third stage of the burro elimination plan, killing burros, was carried out, some people would be offended. A visitor's opinion of aesthetics might be influenced by seeing fabricated devices in an otherwise natural setting and the changes in wildlife numbers by the replacement of guzzlers with restored natural waters.

Damage to natural and cultural resources would be reduced at known sensitive sites (such as desert tortoise critical habitat, Fort Piute, and abandoned historic mining structures) by

evaluation of the damage and subsequent actions to eliminate those impacts. Restrictions on camping and day use might cause people to move into areas elsewhere within or outside the preserve, increasing the level of use and crowding at those locations.

Visitor safety would improve with an expected decrease in the number of accidents involving vehicles and burros or cattle. Visitors would experience fewer disruptions, and greater safety with the restrictions on the seasons, species, and areas where hunting would be allowed. Bighorn sheep hunters would not be affected by this alternative. Hunters of upland game bird and deer would continue to be limited as to hunting areas. Eliminating hunting for all other species would be a negative effect on those hunters. Placing restrictions on the areas, species, and methods of trapping would adversely affect a few trappers who use the preserve for this activity.

Construction activities at the Kelso Depot would adversely affect vehicle traffic near the construction area and people's ability to visit the depot over the short-term. Minor traffic delays might result from construction work. The construction contract specifications could be written to require the contractor to limit traffic delays to 10 minutes or less with exceptions for a few situations where more time would be needed. A temporary parking area with interpretive information could be created near the depot to inform people about the depot and the restoration. This would mitigate some of the impacts on visitors.

The proposed reinforcement of the dike near the Kelso Depot would mitigate potential threats from flash floods by increasing the protection against flooding at the depot. Establishing an early warning system to warn visitors about the potential for flash floods at the depot would improve the safety of visitors and NPS employees.

Placing crossing arms at the existing railroad crossing at Kelso would decrease the potential for collisions between vehicles and trains.

Climbing restrictions would protect resources, but may negatively affect the climbing community. Restricting climbing activities to non-damaging activities would help maintain the landscape in its natural condition. Climbers using drills and permanent climbing aids would have to climb at sites other than the Mojave National Preserve.

A secondary information center at the headquarters office would serve as an information service for the community and a base for an outreach program for local schools and groups. This operation could be similar to those established in Baker and Needles. Local residents near headquarters would not need to travel to Baker for information. The existence of the BLM Desert Information Center and this information center could result in a duplication of functions if not properly coordinated.

An interpretive plan would result in a coordinated long-range program for interpretive development and direction. Ranger-led tours of Soda Springs would offer more access to and information about the historic properties and the area's history. Improvement of the Soda Springs self-guiding tour and visitor structure would improve the quality of the visitor experience and encourage visitors to stay longer and learn more about the cultural,

natural, and educational setting this site. During 1996 the number of annual vehicle trips for visitors and CSU guests on the Zzyzx road was estimated to be between 2,000 and 2,500. If minor improvements were made to the visitor facilities at Soda Springs, this could cause a slight increase in traffic, dust, and normal wear and tear to Zzyzx Road. Impacts to CSU operations may result if visitor use is uncontrolled.

The Kelso Depot information center would increase the number of informed visitors, possibly enhancing their experience and enjoyment at the preserve. Adding a museum and interpretive facility at Kelso Depot would increase traffic at the intersection of Kelbaker and Kelso-Cima roads, with a greater potential for traffic or train and pedestrian accidents. In 1997, approximately 90% of all the preserve's traffic passed through this intersection. Parking lot locations and designs would consider visitor safety. If passenger trains stopped at the depot, more visitors would experience the depot's displays and exhibits. This could lead to overcrowding and a poorer quality of experience. Visits by train passengers would need to be carefully coordinated to be successful, but it would provide an alternative transportation mode and reduce environmental impacts caused by automobiles. Adding food service in the Kelso Depot might lead to increases in the duration of visitors' stay, giving them more time to visit and experience the different parts of the preserve. It also might give them an additional reason to stop at the depot and see the displays and interact with NPS staff. The food services might be a distraction to the visitor center if it was not designed and operated in a way that would complement the visitor center.

Improving accessibility at some campsites and trails at Mid Hills campground for visitors with disabilities would allow more opportunities for these visitors to use these campgrounds.

NPS limits on the number of large groups using the Mojave Road (to reduce conflicts at campsites and avoid possible vehicle congestion) would affect the camping experience along the Mojave Road. The availability of sites would be diminished, but the quality of the camping experience would be improved by a decrease in crowding. The Mojave Road's surface conditions would be retained as near to current conditions as possible, or as determined in the proposed road management plan. Traffic flows would be somewhat regulated by the control of large groups. This action could also reduce the negative impacts on the surface conditions. Daily traffic levels would continue to fluctuate according to public interest in the Mojave Road.

As private lands were purchased, more public lands would be available for visitor use and fewer incompatible development activities would occur in the preserve. There would be fewer complaints about trespassing and some fences could be removed, creating a more natural, open landscape. Visitors would be less confused about what lands they could use. Acquisition of nonfederal lands and interests would reduce potential for additional access restrictions by private parties.

IMPACTS ON THE SOCIOECONOMIC ENVIRONMENT

A separate analysis of socioeconomic conditions in the planning area and the effects of the proposed action was conducted by Dean Runyan Associates under contract to the National Park Service. That analysis concluded that no significant effects would occur in the NEMO planning area as a result of the proposed action. There would be some loss of grazing related jobs if allotments were acquired, but the overall effect would be offset by an increase in tourism jobs. Refer to that report for details.

Acquisition of private lands would remove those properties from county tax rolls. However, the federal government provides payments to the counties in lieu of taxes to compensate them for their loss of taxes. This program is coordinated by the Bureau of Land Management and payments are made annually for entitlement lands and every five years for acquired lands. Payment is computed based on 1% of the amount paid for the property.

IMPACTS ON ADMINISTRATIVE OPERATIONS AND FACILITIES

The initial cost of burro removal would be high. As of May 1998, the preserve's burro population was estimated at more than 1,300. Using BLM figures (estimated costs of \$1,200 per burro, plus staff time and costs), it is estimated that the cost of capturing and adopting all these burros would be about \$2,160,000. The estimate of 1,300 animals was adjusted to include an estimated 15% increase per year for the next four years.

This alternative would result in higher administrative costs to implement the recommendations of the desert tortoise's recovery plan. These costs would diminish when the desert tortoise population was considered recovered. Minor costs would result from administration activities such as wilderness access, guzzler maintenance, water source monitoring, wildlife management, habitat restoration studies and work, law enforcement activities, managing camping restrictions at designated campsites, and construction of improvements to facilities for visitors with disabilities. The NPS administrative workload would increase with the added responsibility of overseeing the depot's concessions operation.

Operating a Kelso Depot museum and interpretive facility and possibly restoring or stabilizing the general store/post office and schoolhouse at Kelso would increase NPS administrative workload and funding needs. Additional funds would be needed for facility operations, maintenance, and administrative functions at the depot. Using the general store/post office for interpretation and creating an outdoor railroad exhibit area would increase the demand for funding and staffing of maintenance and interpretive programs.

New or improved maintenance facilities at Baker and Hole-in-the-Wall would improve operation capabilities. The NPS workload might be relieved by contracting some maintenance work. A shared maintenance yard in Kelso would improve the efficiency of

road maintenance operations by providing a central storage yard for equipment and materials and reducing drive time to work projects.

New or renovated housing in the preserve would decrease the time for employees to get to their jobs and save vehicle fuel. The new housing would place an additional workload on maintenance staff. NPS housing at Baker would be made more energy-efficient where possible, but it would still not be up to NPS standards for housing until trailers are replaced. Improvements would cut down on high energy costs during the summer. New housing at Baker would reduce energy use for cooling at housing.

There would be a large initial administrative workload and cost to acquire properties. However, this workload would diminish over time as nonfederal lands came into public ownership. Some properties have buildings or other structures that may be adaptively used. If this happened, the preserve might have to repair or upgrade the structures to bring them up to current code. Any structures used by the preserve would require a long-term maintenance commitment. Properties acquired with existing disturbance (such as mines or corrals) might need to be restored or stabilized to preserve historic features. Major restoration work would be considered in separate detailed plans.

IMPACTS ON EDUCATION AND RESEARCH CENTERS

Cattle, visitors, and burros could disrupt or destroy research plots. Depending on the time and cost of these plots, the impacts could be significant; however, no evidence of damage has been seen to date. A shorter hunting season would slightly increase safety of researchers, students, and teachers. Designated campsites in sensitive areas would reduce the potential for negative effects on field research projects or sensitive resources.

Replacing visitor facilities and upgrading the self-guided tour at Soda Springs might attract more visitors, creating potential conflicts between educational use and visitors to Zzyzx. The National Park Service would seek a partnership with the University of California to collaborate on research, interpretation, and public education with the intent of increasing public awareness and understanding of natural and cultural resources in the preserve and to reduce the potential conflicts between NPS visitors and CSU objectives.

NPS acquisition of nonfederal lands would make more public lands available for educational and research use.

IMPACTS ON LAND OWNERSHIP AND USE

Elimination of free-roaming burros from Mojave National Preserve would eliminate some resource use conflicts because burros would no longer use private and state forage and water within the preserve. A shorter hunting season would result in less trespassing and fewer hunting incidents. Eliminating roadside camping near private property (where conflicts have been documented) would result in better protection of private property.

Landowners adjacent to ranches would experience less cattle trespassing and fewer resource conflicts.

This alternative would probably result in changes in the operation of the grazing management program. These changes might include more restrictions on grazing activities and ranching practices, such as seasonal closures, fewer cattle grazing in an area, or relocating grazing allotments to other parts of the preserve outside desert tortoise critical habitat. Under NPS management, grazing fees might be increased. The change in grazing management operations with the chance of more grazing restrictions and higher grazing fees might influence the future value of grazing allotments. Removing burros would provide a potential benefit to ranchers by making more forage and water available for livestock use. Once a grazing allotment is retired no future grazing would be authorized for that area.

Impacts from cattle trespassing from adjacent BLM allotments should be minimal. Fencing along the BLM/NPS boundary would be a condition of all leases that abut NPS lands (Tim Salt, Acting Manager of BLM's California Desert District, pers. comm. 1998).

Private lands would be acquired from willing sellers when funds became available. Properties would be purchased at fair market value. Reduction of nonfederal ownership would result in fewer instances of visitor trespass problems for private landowners and greater management control of resource use in the preserve.

The National Park Service would cooperate with private property owners in placing signs or otherwise informing visitors about the need to respect private property. Installing signs next to the proposed interpretive area for the iron ore loading site also would encourage visitors to stay away from Union Pacific work and residential areas. The locations of signs would be coordinated with the Union Pacific. An opportunity for positive public relations would exist for the Union Pacific and the National Park Service if they could together create an outdoor railroad exhibit area at Kelso.

Impacts on mineral development activities would be the same as the existing management alternative.

CUMULATIVE IMPACTS

This alternative would allow for the long-term recovery of the natural desert environment. The speed of this recovery would depend upon the speed of burro removal and the retirement of grazing allotments. Implementing this alternative (and a similar one for Death Valley National Park) would result in a large reduction in burro populations in the California Desert Area's public lands (a 64% reduction in the Bureau of Land Management's recommended herd management level). The recovery of the entire desert tortoise population would be accelerated under this alternative.

Recovery efforts for the desert tortoise are underway in Arizona, California, Nevada, and Utah. These recovery efforts often include the retirement of grazing allotments. Grazing on desert public lands is not continuing in parts of California (Pilot Knob), Nevada (Clark County) and Utah (Upper Virgin River). These existing efforts, the efforts proposed in this plan, and future recovery efforts throughout the desert tortoise's range would result in a significant reduction in the amount of livestock grazing in the Mojave Desert.

Impacts on burros from the potential loss of habitat and a possible increase in the number of injuries or deaths might result from increased activities at three sites near Mojave National Preserve. These sites are proposed expansions at the MolyCorp mine and the National Training Center at Fort Irwin and the approved and expected Castle Mountains Mine expansion. The number of animals affected at these locations are expected to be small but, they would add to the proposed reduction at the units of the national park system.

This alternative would eliminate a large area from nongame hunting activities. Fewer desert tortoises would be shot. No cumulative adverse effects on cultural resources in the national preserve would result from this alternative.

The creation of wilderness by the CDPA closed some areas to vehicle-based roadside camping, increasing the protection for natural and cultural resources in these areas. Eliminating vehicle-based campsites in wilderness would relocate some campers to nonwilderness areas, increasing the use and potentially increasing the negative impacts in these locations.

There would be less overall development of desert habitat and resources on a regional basis as up to 215,000 acres of nonfederal lands and interests in the preserve were acquired.

ALTERNATIVE 2: NO-ACTION ALTERNATIVE

IMPACTS ON NATURAL ENVIRONMENT

Most of the impacts on the natural environment under this alternative are due to the presence of burros and cattle.

Soils. Soils would continue to be affected to varying degrees by foraging of nonnative burros and cattle and their subsequent trampling, as well as by camping. Soil compaction, sheet erosion, and gullying would continue to be caused by burros wallowing and trailing (trails apparently produced by burros). The following quotation documents burro damage at other units of the national park system.

Plant growth was inhibited and erosion accelerated in areas trampled by excessive burro concentrations (Ferrell, 1973). Douglas and Fenn (unpublished data) studied soil compaction in Death Valley by using bulk density sampling and soil penetrometer readings. They found treads of burro trails in Butte Valley (Death Valley National Park) were as heavily compacted as treads of relatively heavily used jeep roads in the same areas and soil type. Compaction extended 6-10 inches below the soil surface. The severity of soil compaction was surprising because soils in Butte Valley are granitic, and thus are relatively coarse and have poor compressibility. Heavily used burro trails on steep slopes in Death Valley and Grand Canyon have contributed to major soil movement and erosion. Carothers (1976) provides a discussion and illustration of burro damage in Grand Canyon along the Colorado River. Compacted trails are almost impervious to penetration by water; precipitation tends to run off compacted soils, leading to erosion. Compacted soils also are resistant to plant colonization. Hundreds of miles of such trails are present in Death Valley National Park and Lake Mead National Recreation Area" (Douglas and Hurst 1993).

The *Environmental Assessment: Clark Mountain Herd Management Area: Burro Management* stated that there was "excessive amounts of trailing and formation of dirt wallows by burros" (BLM 1996). Extensive burro trailing has also been seen in the Cinder Cones and Lava Bed areas of the preserve. Burro damage (wallowing, fouling, and plant destruction) to natural springs has been observed in the Ivanpah Mountains.

Cattle also adversely affect soil. The U.S. Fish and Wildlife Service's April 20, 1994, Biological Opinion on the desert tortoise provided the following information of grazing/soil impacts:

It [grazing] also causes soil erosion and compaction, reduced water infiltration rates, and increased runoff (Klemmedson 1956, Ellison 1960, Arndt 1966, and Gifford and Hawkins 1978), leaving less water available for plant production (Dadkash and Gifford, 1980). The intensity of damage to soil caused solely by cattle is assumed to be directly proportional to the AUMs (Animal Unit Months) of forage used per pasture (BLM 1980a).

Surface disturbance from roadside camping would likely expand from the use of sites without apparent boundaries. This surface disturbance to soils and vegetation would expand over time. Favorite camping sites would increase in size as use over the years expands the campsites out toward the undisturbed desert. Visitor use of the Mojave Road would continue to create minor negative impacts such as dust and soil erosion.

Vegetation. Vegetation would be affected to varying degrees by the nonnative burros and cattle foraging and their subsequent trampling of the soil and by camping activities. Burro population control would help reduce overgrazing of the native vegetation. On average burros eat 4.5 kilograms (9.9 lbs.) of dry forage per day (Douglas and Hurst 1994). Normal plant growth patterns and rates would not resume with the presence of burros. Burro overgrazing leads to less plant biomass available for native wildlife, thus a lowering of the habitat's carrying capacity (Woodward 1976).

Numerous studies documenting native vegetation damage from burros exist, and the findings are consistent; that is, burros damage native vegetation (see Douglas and Hurst 1994). However, the results of exclosure studies are not so definitive. Exclosures are fenced areas, that exclude the animals being studied usually for many years to determine the effects those animals have on vegetation and the environment by comparing the protected area to the area outside of the fence. Some investigators have noted large differences between the plant volume and diversity inside and outside of these exclosures; other investigators have noted no significant differences. The same parameters were studied, but the studies took place at different locations.

Douglas and Hurst cited Longshore and Douglas' (1988) research results where vegetation recovery was studied following burro removal. They found significant differences in species diversity, but no differences in mean volumes of perennial shrubs inside and outside of a Death Valley exclosure. They noted that, where browsing by burros was relatively minor, over a three-year period the rapid recovery of shrubs was evident. No recovery of the perennial grasses was noted. (In this research area grasses made up 48% of the burros' diet).

The interim burro population maintenance program (keeping the herd at the target level of around 130 burros) would result in periodic disturbance to the desert vegetation from inadvertent trampling of vegetation by burros and capture crews during the capture operation.

It is known that grazing can change the species composition and densities of vegetation. The following is also from the 1994 FWS "Biological Opinion":

Livestock grazing can result in decreased shrub cover (Webb and Stielstra, 1979) and desirable shrubs (Orodho et. al., 1990). Weedy exotics, such as split grass (*Schismus arabicus*), checker fiddle neck (*Amsinkia intermedia*), and filaree (*Erodium cicutarium*), and cheatgrass (*Bromus tectorum*) have benefited from grazing, while perennial bunchgrasses, which are highly palatable grazing forage, have become less abundant (Berry and Nicholson, 1984, Kie and Loft, 1990).

The restoration of the desert environment and its vegetation would be a slow process. Complete recovery, if it can happen, would occur at the very minimum over decades. Again, from the 1994 FWS “Biological Opinion”:

After 10 years of cattle exclusion in the Ivanpah Valley, there were no significant differences in annual plant cover, biomass, or density between grazed and ungrazed plots (Avery, et. al., 1992). Volumes of creosote and bursage were greater in the grazed plot as compared to the ungrazed plot, but no differences in total perennial plant cover were detected.

In the above study, differences were also observed in soil compaction, including greater compaction in the grazed area outside of the enclosure. The U.S. Fish and Wildlife Service noted that the above results were complicated by the “limited data on soil and vegetation parameters” before the cattle were excluded and that there had been trespass grazing inside the enclosure. The U.S. Fish and Wildlife Service also stated “Mojave Desert vegetation recovers very slowly from disturbance (Vasek et al. 1975a and 1975b, Lovich 1992) and 10 years may not be long enough to detect differences between grazed and ungrazed plots.”

Most woody vegetation would continue to be protected from damage by the ban on firewood collection.

Wildlife. Competition for food, water, and space between bighorn sheep and burros is strongly suspected by many biologists, and overlaps of food and range are known to occur in Mojave National Preserve. Researchers have found dietary overlap between burros and bighorns ranging from 20% to 67% (Douglas and Hurst 1993). Douglas and Hurst cite the following from Norment and Douglas’s 1977 paper:

The desert bighorn and burros live in areas having environmental uncertainty. It seems reasonable to assume desert bighorn are resource limited. Burros may also be resource limited, but because of their generalized food habits, they are less limited by forage resources than bighorn. In deserts of the western states, habitats of both species have continually fluctuating carrying capacities, being highest in spring and lowest in winter. Primary productivity of desert habitats is low, and dependent upon the amount and timing of precipitation. Availability of nutritious forage is thought to be the most limiting resource of these species. Foraging strategies of bighorn sheep have evolved in synchrony with their habitats, whereas feral burros have not evolved with the same resource set.

Studies in 1961 and 1984 showed that the presence of burros at springs has had an inhibiting effect on bighorn ewes; bighorn rams appear to be less intimidated. The findings were: “Ewes generally would not drink if 3 or more burros were present at the spring. Rams drank at the springs burros utilized, but a spring not used by burros received much heavier use by ewes than springs used by burros. Burros have the tendency to lounge in groups at water sources, often remaining there for hours, or even entire days” (Douglas and Hurst 1993). Such inhibiting of bighorns would continue under the no-action alternative.

A 1977 study in Bandelier National Monument found significant differences in small mammal populations (deer, mice) in areas where burros were present. In the monument's pinyon-juniper woodlands a reduction 10-33% of small mammals was found compared to the control areas that were without burros (Guthrie 1977). It is assumed that similar small mammal population declines have occurred within the Mojave National Preserve's pinyon juniper woodlands (constituting about 10% of the preserve) and within other community types that share burro and small mammal populations. Any such declines would continue under the no-action alternative.

The burro population maintenance program (keeping the herd at around 130 burros) would require periodic disturbance of desert wildlife by noise (helicopters, horses, trucks, wranglers, etc.) and inadvertent trampling of small animals and their habitats from capture crews and their equipment during the capture operation. Larger mammals, such as deer and bighorn, would leave the local area during these activities.

The preserve's developed water (wildlife guzzlers and other livestock water developments; mining developments) might be affecting the preserve's wildlife populations. This artificially increased amount of water may be allowing some wildlife populations to grow to levels unobtainable if only available natural water was available. For example, there are no seeps or springs in the Kelso Mountains, yet a large herd of bighorn sheep is thriving, and this is probably due to the big game guzzler at Kelso Mountain. The population growth here and possibly at other locations might be affecting native vegetation. With more animals surviving because developed water is available, these larger populations would need more food. The limited amount of water available for plants, desert plants' slow growth and recovery rates, and the possible increased wildlife populations could have adverse ecological effects, because animals would be eating more than what is being replaced. This situation would continue under the no-action alternative.

Hunting is allowed year-round and there are no limits on the killing of hares (black-tailed jackrabbits) and many nongame animals such as coyotes, skunks, and opossum. The effects on these populations from hunting are unknown.

Desert Tortoise. The 1994 FWS "Biological Opinion" describes the adverse effects burros can have on the desert tortoise. The FWS report says that grazing by burros can damage soil crusts, reduce water infiltration, promote erosion, inhibit nitrogen fixation in desert plants, and provide a favorable seedbed for exotic annual vegetation. The U.S. Fish and Wildlife Service recommended that burros should be prohibited in areas set aside for the desert tortoise's recovery (which it calls "Desert Wildlife Management Areas"). There are two such areas recommended in the preserve, covering about 70% of the preserve and about 50% of the BLM's Clark Mountain Herd Management Area). The U.S. Fish and Wildlife Service also recommends that the hunting season be limited to big game and game birds and be open only from October through February.

Many investigators have observed cattle trampling and destroying desert tortoise burrows. However, little is known of the effects on individual tortoises, and nothing is known of the trampling effects on desert tortoise populations in general. The effects of grazing on the desert tortoise remain unclear.

A large part of the Mojave Desert is not in pristine condition, and some current conditions can be related to past grazing management practices. No information could be found on densities of the desert tortoise (*Gopherus agassizii*) or on vegetative conditions of areas that had not been grazed to allow managers a comparison of range conditions with data on tortoises. Experimental information to assess the effect of livestock grazing on tortoises is lacking, and researchers have not yet examined whether the forage that remains after grazing is sufficient to meet the nutritional needs of desert tortoises. (Oldemeyer 1994)

Water. Burros are known to contaminate water sources through defecation and urination, overbrowsing or elimination of aquatic and riparian vegetation, and monopolizing the use of springs or seeps. On average, burros consume 22 liters (5 gallons) of water per day. In comparison, bighorn sheep consume about 3.8 liters (1 gallon) per day (Douglas and Hurst 1995).

Cattle ranching and mining in the desert required changes in the natural waterflow and in water quality, and supply. Flows from springs and seeps were diverted or dammed, water was piped miles away from the source, wells were drilled, stock tanks were excavated, and other developments such as windmills and troughs were needed. These changes brought changes to the natural environment. When the flows from springs and seeps were diverted, the remaining aquatic/riparian flora and fauna were greatly reduced or eliminated. Water piped from the springs and seeps, or taken from wells and piped to tanks and troughs, is used by cattle, burros, and wildlife. This situation would continue under the no-action alternative.

The land and vegetation near the troughs and tanks are subject to heavy, concentrated use by cattle and burros. This use compacts the soil and denudes the vegetation near the troughs and tanks. In many parts of the preserve, miles of plastic water pipes (previously buried in shallow trenches and used to provide water for the cattle) that are no longer being used have been exposed and broken and now litter the desert. The effects on the soil and vegetation near the troughs and tanks and at the springs and seeps would continue with the implementation of this alternative.

Of the preserve's 1.6 million acres, almost 15% is private or state lands and mining claims and could be subject to development activities incompatible with the preserve's purposes. Developments such as mining or agriculture would result in the loss of vegetation and wildlife and could affect surface water and night sky. Disturbance of the surface soil could add particulates to the air, adversely affecting the air quality.

IMPACTS ON CULTURAL RESOURCES

Cultural resources are potentially threatened by vandalism and by trampling from burros and cattle. Many prehistoric cultural resources are located near springs, since ancient peoples used springs. Known and undiscovered cultural resources at these areas might be trampled and destroyed by burros. Visitors camping or driving near isolated and unprotected sites would adversely affect cultural resources. Historic or significant structures could be adversely affected by campers' use of wood from historic structures for fires or by other acts of vandalism. Monitoring by rangers would continue to provide limited protection of archeological sites and ruins.

Historic properties listed on, or determined eligible for listing on, the national register would continue to be afforded stabilization/preservation treatment as funding allowed; however, preservation treatment would focus primarily on key resources in high-use areas. Background studies for rehabilitating and adaptive use of historic structures such as the Kelso Depot, would continue to be emphasized to ensure the preservation and interpretation of significant historic properties. The structural frame of the Kelso Depot would be stabilized under current plans, but the building would continue to be at risk to vandalism and deterioration as a result of not being completely restored and occupied.

IMPACTS ON NATIVE AMERICAN INTERESTS

Sporadic communication with affected tribes occurs primarily on a project-specific basis. This approach often leads to misinformed decision-making and distrust because of a lack of information. The presence of sacred and traditional use areas is not fully identified or understood and therefore might be inadvertently harmed.

The information center in Needles would continue to provide an opportunity to raise public understanding and appreciation of tribal ties to the Mojave Desert and to foster relationships with the tribes.

IMPACTS ON VISITOR USE, SERVICES, AND FACILITIES

Drivers often travel over many of the paved roads in the preserve at more than 70 mph. More vehicles on the roads, combined with fast speeds, would increase the chances for traffic accidents. Accidents with vehicles hitting burros or cows occur frequently . About 10-30 cows (Clay Overson pers. comm. 1997) and about 20 burros died by being struck by vehicles in the preserve. Often, the people in the vehicle are also injured. The number of accidents would probably remain the same under the no-action alternative. The 1997 accident figures occurred when the burro population was over 1,300 animals. The numbers of burro/vehicle accidents probably would be reduced and remain stable as the preserve approached the herd size of 130 that would be implemented under this alternative.

Visitor access to the Mojave Road would continue to be unlimited. If road use increased, an adverse effect of excess wear and tear on the surface could result. Increased vehicle use would also lead to crowded roadside camping areas, excess dust, and less enjoyment of feelings of isolation, changing the quality of the visitor experience. The road's surface conditions would continue to deteriorate without NPS maintenance or volunteer efforts. Road shoulders and adjacent vegetation would be adversely affected if people drove off the roadway to avoid rough spots.

The desert tortoise's recovery would not be accelerated under this alternative. Therefore, fewer opportunities for seeing the tortoise might diminish visitors' enjoyment.

The public has limited access to historic properties at Soda Springs with the existing interim management agreement between California State University and the National Park Service.

Most visitors would continue to arrive without receiving advance information. The information panels to be installed near the proposed entrance signs, the information centers at Baker, Needles, and Hole-in-the-Wall would continue to provide travelers with specific information, but they would reach a fraction of the visitors. A 1997 visitor study indicated that 46% of all visitors to the preserve were visiting for the first time. This situation would continue to leave a large percentage of visitors with a limited amount of travel or interpretive information. There would continue to be a high potential for problems related to uninformed visitors.

If campground use dramatically increased there could be some negative impacts on campers who could not get into full campgrounds. These people might leave the preserve or try to find a roadside camping site close to the developed campgrounds. Visitors with disabilities would be adversely affected at the Mid Hills campground because of the low number of accessible trails and campsites. Equestrian use at the Hole-in-the-Wall group area would be adversely affected because there would be no piped water at the corrals.

Cattle and ranching activities, guzzlers and stock tanks, and hunting and trapping would influence visitors' enjoyment and perception of aesthetics in an otherwise natural setting of a unit of the national park system. Visitors would experience private development activities such as mining, house building, and potentially hotels and other visitor service facilities that could be in conflict with the preserve's purpose. The National Park Service does not regulate development on private lands except for mining on patented claims and landfills on all lands; therefore, it would have to try to protect the preserve's resources through the state and county permitting authority. With almost 15% of the preserve containing nonfederal lands or interests, trespass complaints could occur, along with a possible increase in fencing and "no trespassing" signs. At the same time, there is some concern that visitors would not understand the fencing of public lands for grazing and therefore would feel unwelcome to use certain public fenced lands.

IMPACTS ON SOCIOECONOMIC ENVIRONMENTS

A separate analysis of socioeconomic conditions in the planning area and the effects of the proposed action was conducted by Dean Runyan Associates under contract to the National Park Service. Refer to that report for details on the existing conditions.

IMPACTS ON ADMINISTRATION

Maintaining a herd size at 130 burros would be the most expensive alternative over the long term. BLM personnel estimate the cost for capturing, transporting, adoption preparation (veterinarian care, feed and board), and adoption is \$1,200 per animal (Dave Sjaastad, BLM, pers. comm. 1997). The cost of reducing the existing herd down to the herd management level of 130 from the estimated population (May 1997) of at least 1,300 burros would be about \$1.9 million. If the burro population's growth rate (estimated between 10-20%) is assumed to be 15%, an average of 20 burros would have to be removed each year, costing about \$24,000 per year, not counting staff time in order to maintain a population of 130 animals. Under this alternative, these costs would continue for the long term.

The grazing fees collected under this alternative would not be sufficient to manage a grazing management program. Additional funding would be needed for staff time and program costs associated with the grazing program.

Implementing the desert tortoise recovery program would entail some initially high administration costs, but the costs should diminish as recovery proceeded. Administering wilderness access and guzzler maintenance would result in high administrative review, permitting, and monitoring costs. Authorized vehicles would continue to be allowed access into wilderness. Year-round hunting would result in minor increases in workloads and costs for law enforcement activities.

Campground maintenance and fee collection would continue with existing staff and volunteers. NPS housing at Baker would continue to be below current NPS standards because of the use of trailers and the lack of other housing alternatives in town. NPS housing at Hole-in-the-Wall would continue to be inadequate for staff use. The Hole-in-the-Wall contact center provides little privacy and would not be adequate for the staff needed to operate the facility. Firefighting staffing levels may increase. The dormitory housing at Hole-in-the-Wall is already at capacity. Any increase would place the fire crew in overcrowded conditions. The garage for the fire truck would continue to be too small to properly park the truck and hold and protect support equipment. The headquarters building is out of compliance with federal regulations concerning access for persons with disabilities.

NPS staffing levels would not increase as a result of this alternative. However, in most instances workloads would increase, limiting the National Park Service's ability to serve the public and protect the resources.

IMPACTS ON EDUCATION AND RESEARCH CENTERS

Cattle grazing, feral burros, and visitation could disrupt or destroy research plots. Depending on the time and cost of these plots the impacts could be significant; however, no evidence of damage has been seen to date.

Long-term field research projects could be adversely affected by visitor recreation activities. The public is generally unaware of the reserve's research and education function, so that conflicts could develop between the public and researchers, teachers, and students who use the Granite Mountains Natural Reserve.

There is minimal conflict between the public and education and research within the preserve because of low visitation to Soda Springs Desert Studies Center and the Granite Mountains Natural Reserve. Some visitors to Soda Springs might continue to stray from the interpretive trail because of limited information placed along the trail and their interest in historic buildings. To mitigate such effects, more interpretive information could be placed in front of the historic buildings to interpret their past and explain their current functions.

IMPACTS ON LAND OWNERSHIP AND USE

Free-roaming burros and cattle in Mojave National Preserve would continue to present some resource use conflicts. Burros would use forage and water on unfenced private and state lands within the preserve resulting in increase expenses for ranchers to run and maintain gas-driven pumps to fill stock tanks with well water. The significance of these impacts is unknown.

There is potential for increased visitation in the preserve. Installing six information panels near the proposed entrance signs would provide limited information about the preserve. The signs could be a reminder for visitors to respect private property and possibly reduce some conflicts between the public and private landowners.

Unoccupied public and private structures could be subject to theft and vandalism.

No negative impacts to landowners would be anticipated from construction in the preserve on federally owned land or on leased private land.

Mitigation for proposed mineral development proposals do not meet the regulatory approval standards for the Preserve, the NPS would seek to acquire the property or interest. Depending on the mineral commodity and value of the property, this could result in a substantial expense. It would also prevent the removal and use of that mineral. The significance of this cannot be determined until a specific mining proposal actually is denied

CUMULATIVE IMPACTS

The effects of burros and cattle on soils, water, flora, and fauna would be significant and cumulative. Restoring native landscape to its original condition would be inhibited. Implementation of this alternative would not contribute positively to the population-wide recovery of the desert tortoise. Unlimited hunting seasons and bag limits on some species might adversely affect those populations.

The cumulative impacts of the no-action alternative on archeological sites, ethnographic resources, and historic properties are difficult to analyze because there has been no long term monitoring program. Development near archeological sites would increase the likelihood of eventual inadvertent damage to the sites, resulting in a slow deterioration of resources over time. Even controlled excavation of sites would damage them because current methods, technologies, and research emphases cannot anticipate the needs of future researchers. Therefore, data recovery is usually regarded as only a last-resort option to preservation in place.

It is presumed that the significance and integrity of ethnographic sites would be diminished by increasing visitation because such sites become less suitable for ethnographic uses as more people congregate near them. Piecemeal inventory, evaluation, interpretation, and preservation of archeological sites, ethnographic resources, and historic properties and cultural landscapes would not enable the National Park Service to manage cultural resources in the preserve in a manner consistent with the requirements of the National Historic Preservation Act or the National Park Service's *Cultural Resource Management Guideline*.

The development of private and state lands in the preserve would contribute to the overall loss of desert resources and habitat for native species. Potential road closures by landowners irritated by trespass and vandalism could reduce overall public access even further (beyond the closure of roads in wilderness areas designated by the CDPA, and potential route closures for protection of sensitive species and habitat).

Denial of mining proposals that do not meet NPS regulatory approval standards would contribute minimally to the existing situation where large expanses of the desert are no longer available for mineral entry, and therefore, development opportunities are restricted.

ALTERNATIVE 3: OPTIONAL ALTERNATIVE

IMPACTS ON NATURAL ENVIRONMENT

Impacts under alternative 3 would be the same as those of the no-action alternative except that grazing would be restricted and possibly phased out or restricted if research demonstrates the need. Over time, limiting or reducing grazing might allow the soils, water, vegetation, and wildlife to be restored.

Limiting the use of guns to the September through February hunting seasons (when desert tortoises are mostly inactive) would result in fewer tortoises being killed by vandals.

Limiting vehicle use on the Mojave Road would protect the current visitor experience and resource values.

Minor impacts on vegetation and wildlife would result from the construction of the following proposed projects:

- new housing in the preserve and in Baker
- information center and comfort station at Kelso
- visitor information center at Soda Springs
- nature center at Hole-in-the-Wall
- roadside pullouts for interpretive panels
- restrooms, picnic tables, and fire rings at isolated camping areas

Each of these projects would involve not more than 3 acres of disturbance. Using previously disturbed land would limit negative impacts in all locations.

Establishing designated camping areas at remote locations would reduce the expanding surface disturbance associated with continued use. In the long term these facilities could decrease negative impacts from visitor use by confining impacts to specific campsites and reducing the potential for human waste in the landscape (U.S.

Forest Service 1987). If tables were anchored to the ground, the spread of ground disturbance would be reduced even further. This would help reduce the potential for visitor disturbance of desert tortoises when the animals were active above ground, which would help the efforts of the desert tortoise recovery plan. However, it would not deter impacts on burrows and habitat the rest of the year.

The presence of more staffed visitor centers would provide more opportunities for NPS staff to educate the public about protecting natural resources. This could result in fewer negative impacts on natural resources than under the proposed action.

IMPACTS ON CULTURAL RESOURCES

Restricting hunting seasons would allow more control of the illegal use of weapons in the nonhunting season, enhancing the cultural resource protection of cultural resources. Restricting roadside camping locations would result in greater protection and less disturbance of existing archeological sites and sensitive cultural sites.

IMPACTS ON NATIVE AMERICAN INTERESTS

There would be a lower potential for impacts on sacred sites if campers were only allowed to camp at designated roadside campsites.

IMPACTS ON VISITOR USE, SERVICES, AND FACILITIES

Restricting hunting to the September through February designated CDF&G seasons for upland game and big game would adversely affect nongame hunters; however, shortening the season when guns were allowed would increase visitor safety.

Restricting camping in desert tortoise critical habitat during periods when the animals were active above ground would adversely affect visitors who might want to camp in those areas at that time. Those affected would be a minority of the preserve's visitors. Alternate camping sites are available within the preserve.

Adding a Hole-in-the-Wall nature center and an information center at Kelso could create more opportunities for visitors to understand the preserve's cultural and natural resources. More interpretation would be available to visitors at the developed campgrounds. The nature center might offer additional activities for children staying at the developed campgrounds and provide a base for outdoor education classes. Adding more structures at Kelso could be visually distracting from the depot.

Visitation and traffic levels would increase because of the improvements at Kelso Depot, Soda Springs, and Hole-in-the-Wall. To mitigate adverse effects on the road surface and control dust, it might be necessary to gravel or otherwise improve the surface of the Zzyzx Road and other unpaved roads.

Increasing National Park Service use of Soda Springs facilities for outreach classes and events could adversely affect California State University operations.

Adding a group camp area at Mid Hills would give groups a cooler summer alternative to the Hole-in-the-Wall group area, which normally receives minimal summer use because of its hotter temperatures. Constructing hiking and interpretive trails to connect the campgrounds would increase recreational opportunities for visitors who preferred hiking on established trails. Visitors with disabilities would also benefit from the Mid Hills campground improvements.

Backcountry campsite improvements would increase the spectrum of camping opportunities in the preserve. Some people might prefer to camp at these locations, which would have fewer people and more solitude than the developed campgrounds. This action could also reduce demand on the developed campgrounds. Adding improvements to backcountry campsites would adversely affect people who have been camping in these areas for years and would not want changes made to their favorite sites. Campers in high-use camping areas would benefit from the installation of improvements such as campfire rings and picnic tables.

Limiting vehicle use on the Mojave Road would mean that some visitors might be able to use the road when they wished to. The positive effect would be that the quality of the visitor experience and camping along the road would continue to be good. Large groups might be restricted from using the Mojave Road on certain dates, but they would be able to choose any previously disturbed campsite they want (based on availability). Some groups may be denied access to a section or all of the road if other large groups were using it on the same day. This would adversely affect groups that would not be able to travel when they wanted to, but it would overt problems with traffic congestion on this narrow road.

IMPACTS ON SOCIOECONOMIC ENVIRONMENTS

A separate analysis of socioeconomic conditions in the planning area and the effects of the proposed action was conducted by Dean Runyan Associates under contract to the National Park Service. Refer to that report for details.

IMPACTS ON ADMINISTRATIVE OPERATIONS AND FACILITIES

Implementing this alternative would necessitate more NPS staff to operate new information centers at park headquarters, and Soda Springs and the Hole-in-the-Wall nature center. The availability of more information on recreational opportunities might increase visitation to features such as the Kelso Dunes, creating a ripple effect in needed administrative support for these areas. Increasing the number of NPS ranger tours and programs would also increase the administrative and operational workload for the National Park Service.

Expanding campgrounds, improving designated backcountry sites, and adding interpretive trails would create an additional staff workload. Construction would create a short-term increase in workloads, but additional campsites and camping areas would increase the daily work for years into the future. The additional improvements to backcountry sites would increase the distances the staff would be required to travel to maintain camping facilities.

Monitoring and enforcing the Mojave Road's vehicle capacity would require additional staff time and effort. This might eventually lead to a reservation or permit system, which could be used to control the number of vehicles on the road. This would be a negative impact on the administrative workload. Some work might be performed by private sector contractors. Using volunteers would reduce NPS efforts in road maintenance and care of roadside campsites.

Existing staff office space on the east side of the preserve could result in a field office in a community with adequate community services. This would place more employees on the eastern edge of the preserve to better serve the public and Native American tribes. The distance between this office and headquarters would be an adverse effect on daily operations and communications between these two offices.

Removing land parcels with existing commercial services at freeway overpasses from the preserve boundary, would eliminate the need for NPS employees to issue permits and monitor them for compliance.

IMPACTS ON EDUCATION AND RESEARCH CENTERS

A shorter hunting season would increase the safety of researchers, students, and teachers.

Adding an information center at Soda Springs (designed for a non-staffed operation) and NPS guided tours would increase visitation, creating potential conflicts between CSU and the public. Ranger-guided tours and interpretive displays and programs at the information center would provide information about scientific desert research.

The partnership between the National Park Service and the University of California to collaborate on research, interpretation, and public education would increase public awareness and understanding of natural and cultural resources.

IMPACTS ON LAND OWNERSHIP AND USE

A shorter hunting season would result in less trespassing and fewer hunting accidents. New information centers at Hole-in-the-Wall and Soda Springs would serve to dispense information on the need to respect private property.

Impacts on mineral development would be similar to the existing management alternative, except that increased acquisition of mineral rights would occur as a result of the sensitive resource analysis and the identification of areas where mineral development would be incompatible with the preserve mission. This increase is not quantifiable at this time, however a separate impact analysis would be performed at the time the sensitive resource analysis occurs.

CUMULATIVE IMPACTS

If restrictions on grazing were imposed, the desert vegetation, soils, waters, and wildlife would eventually be restored to pre-impact levels in those specific areas.

Lack of long-range cultural resource planning, except as critical needs arise, could lead to intermittent and reactive management actions in the preserve. The lack of an integrated approach to cultural resource management could result in the deterioration of some resources.

OTHER COMPLIANCE REQUIREMENTS

The following is a list of mandatory topics that must be covered in a NPS environmental impact statement. Where relevant, additional information on these topics is covered in the proposed action and alternatives section of this draft document.

Possible conflicts between the proposed action and land use plans, policies, or controls for the area concerned (including local, state, or Indian tribe) and the extent to which your park will reconcile the conflict

The proposed actions would be in conflict with the current code of regulations of the California Department of Fish and Game. The National Park Service will consult with California Department of Fish and Game and encourage that agency to publish new regulations that reflect the changes once they are approved. No other conflicts are identified.

Energy requirements and conservation potential

Energy conservation is a major design factor in any construction activity proposed in this document.

Natural or depletable resource requirements and conservation potential

The actions proposed in this draft document promote the conservation of the preserve's resources and the enjoyment of these resources by the public.

Urban quality, historic and cultural resources, and design of the built environment

Before the anticipated work on the Kelso Depot and the preserve's other historic structures can begin, the resources will be evaluated for their historical significance following historic preservation laws. This evaluation will be used in guiding the design for any future construction work.

Environmental justice (EO 12898) (socially or economically disadvantaged populations)

Any socially or economically disadvantaged population within the preserve would not be adversely impacted by any of the alternatives presented in this document.

Wetlands and floodplains

Before any construction work begins in Kelso Depot, Mid Hills Campground, or near the Hole-in-the-Wall area, a floodplain report will be prepared. Preliminary work for the floodplain report began in March 1998. Spring (wetlands) restoration is part of the

proposed action. The proposed action recommends the elimination of hunting and trapping near wetland areas.

Prime and unique agricultural lands

There are no known extant agricultural lands within the preserve.

Endangered or threatened plants and animals and their habitats.

The preserve's sensitive species, including federally listed and state-listed endangered or threatened species have been identified. Specific actions are proposed to promote the recovery of the desert tortoise and the Mohave tui chub. Other sensitive species would not be adversely impacted by the proposed action.

Important scientific, archeological and other cultural resources, including historic properties listed on or eligible for listing on the National Register of Historic Places

The preserve is fortunate to have two academic field stations within the preserve. Significant archeological and cultural resources and a number of historic properties that are eligible for the National Register of Historic Places are also present within the preserve. These features are described in the "Affected Environment," "Alternatives," and "Environmental consequences" chapters of this document.

Ecologically critical areas, wild and scenic rivers, or other unique natural resources

Ecologically critical areas in the preserve are desert tortoise designated critical habitat, Mohave tui chub ponds, and numerous unusual plant assemblages. These features would be protected through the proposed action of this document.

Mojave National Preserve carries out the NPS responsibilities for the national natural landmark (NNL) program associated with five areas: Cinder Cone Natural Area NNL, Mitchell Caverns and Winding Stair NNL, Amboy Crater NNL, Rainbow Basin NNL, and Turtle Mountain NNL. Each of these designated areas is a nationally significant natural resource warranting the highest level of protection and preservation from degradation of the characteristics that qualified it for designation as a national natural landmark. The National Natural Landmark program activities include annual inspection and reporting on the condition of the landmarks or threats to them and developing and maintaining partnerships with federal, state or other owners of the national natural landmark to promote their continued preservation and protection. Cinder Cone and Mitchell Caverns are within the preserve's boundaries; the former is managed by the preserve and the latter is managed by the California State Parks. Amboy Crater, Rainbow Basin, and Turtle Mountain are administered by the Bureau of Land Management.

Public health and safety

Public health and safety issues are addressed in this document. To promote public safety, the proposed action calls for additional public access to information regarding public health and safety and for restricting the hunting seasons, the number of species hunted, and the locations where they can be hunted.

Sacred sites / Indian trust resources

Sacred sites and Indian trust resources will be identified and agreements reached on the protection of these sites and resources in future consultations with the affected tribes.

SUSTAINABLE AND LONG-TERM MANAGEMENT

The National Park Service has a responsibility to sustain the land within its jurisdictional boundaries as a thriving ecosystem while preserving cultural resources and sustaining the quality of the human experiences that can be had on the land. Ecosystems do not recognize political boundaries; this fact may require the National Park Service to act upon external influences that could influence elements within the political boundary. The National Park Service is challenged to support the economic viability of the communities within and surrounding the national preserve while achieving environmental and cultural resource protection. The concept of sustainability recognizes that our world is dynamic, that change will continue to occur, and that the interrelationship between human beings and the environment must be considered in making decisions. Sustainability is a continual process, a way of thinking about now and the future, not a static set of characteristics that may be defined.

The National Park Service will apply the principles of sustainability to the management of all applicable aspects of this unit of the national park system from interpretation to development and management of facilities. Guiding principles include the efficient use of local resources such as water, energy, and materials to reduce waste, environmental impacts and management costs, and sustaining the quality of the visitor experience and life for local residents by maintaining scenic beauty, environmental quality, and visual harmony within the built environment and its surroundings. The National Park Service would also work with local communities to encourage economic activities that protect and improve the quality of the environment.

The relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity

Over the short term the implementation of the proposal would disrupt visitor services, some historic features, and a small part of the natural environment during construction and the roundup, moving, and adoption of burros. Over the long term, the proposed action would result in the elimination of burros, reductions in cattle grazing, and restoration of natural vegetation and water. To a slightly lesser extent, the optional

alternative would allow the natural habitat to recover. Over the long term, the no-action alternative would not provide for the natural habitat's recovery.

Any irreversible or irretrievable commitments of resources

Construction activities under the proposed action would have irreversible and irretrievable impacts. The construction of the various visitor and information centers, campgrounds, and the Kelso Depot, would not exceed 3 to 25 acres of habitat (0 acres of critical habitat) within the Mojave National Preserve. There would be no construction impacts under the no action alternative and optional alternative impacts would be slightly larger (from 3–50 acres) than the proposed action. For all alternatives, any mining activity within the preserve would permanently damage the natural environment. The extent of the damage would be mitigated, but some damage would still be present.

Future facility planning and management would also be directed by the National Park Service's *Guiding Principles for Sustainable Design* published in 1993 by the Government Printing Office. Sustainable actions could include reducing waste and water and energy consumption and improving or maintaining the quality of human experiences while reducing or eliminating impacts to the natural environment. Facilities must relate to the qualities of the surrounding landscape, local or regional architectural themes, providing a special sense of place. Continued operation of facilities would also be managed under sustainable principles such as high visitor satisfaction, easier maintenance, lowering operational costs, reducing waste, and reducing water and energy consumption.

Any adverse impacts that cannot be avoided should the action be implemented

Between 3 and 50 acres of land in the preserve would be lost to developments for visitor and maintenance use. If mining proceeded, those impacts would also be unavoidable. Hunting and trapping opportunities within the preserve would be diminished with the selection of the proposed action or the optional alternative.